Chapter F-14
Backfilling Boreholes and Excavations

14-1. General Safety Precautions

All open boreholes, test pits or trenches, and accessible borings, including shafts or tunnels, must be covered or provided with suitable barricades, such as fences, covers, or warning lights, to protect pedestrians, livestock or wild animals, or vehicular traffic from accidents (EM 385-1-1). After the excavations have served their intended purposes, the sites should be restored to their original state as nearly as possible. Boreholes or excavations which are backfilled as a safety precaution may be filled with random soil. The quality of the backfill material should be sufficient to prevent hazards to persons or animals and should prevent water movement or collapse, particularly when drilling for deep excavations or tunnels. The soil should be tamped to minimize additional settlement which could result in an open hole at some later time. If surface casing has been set, the casing may be capped. If an uncased borehole must be reopened at a later time, a pole which is slightly smaller in diameter than the borehole may be inserted into the hole; a crosspiece which has been firmly attached to the upper end of the pole will be useful for removal of the pole from the hole as well as marking the location of the borehole and preventing the pole from falling into the hole.

14-2. Grouting

All boreholes located on the landside and riverside of levees, upstream and downstream of dams and embankments, and in or under proposed structures should be grouted to prevent water from passing from one stratum to another through the borehole and/or to prevent piping to the surface. The borings should be grouted by injection through a grout pipe inserted to the bottom of the hole which will displace the water or drilling mud and fill the hole with a continuous column of grout. The grout should contain bentonite or some similar swelling material to inhibit shrinkage and ensure a good seal. A grout mixture of about 4 to 7 percent bentonite and 93 to 96 percent portland cement is suitable for sealing boreholes. Sand may be added to the grout as filler if the proper mixing and pumping equipment are available.

14-3. Concrete

Concrete may be used for backfill if a shrinkage inhibitor is added. Concrete should be placed in the bottom of the borehole by the tremie method to prevent segregation of the mixture and to ensure that water or drilling mud are displaced and the hole is filled with a continuous column of concrete (CE-1201).